

See every room in a workshop would be benefitted by
having one ready for all hands. In hardening turning
tools more especially it is invaluable as it gives so little
light, the exact colour of the steel can be accurately
noted, & the water for dipping may be within 2 inches
of the flame the exact heat is given with the greatest
nicety. another advantage is that no scale is raised
which in the case of fine taps is of some value.

If you like to send down a ^{description of} large coarse draw-
ing (white on black or blue) of the "Thunderbolt" for being
read at the Society of Arts I shall be happy to take
charge of it

Believe me dear Sir very truly yours

John Lubbock

James Nasmyth Esq

Knowing the interest you take in Babylonian antiquities I beg your acceptance of
an ancient lead with some cuneiform characters. I add impressions from
some ancient Egyptian leads in which a tendency to represent form by straight
lines is recognisable. These latter are engraved in agates by the hieroglyphs which
not as in Indian leads by digging with a diamond point.

13 Randolph Crescent Edinb. 6 Dec. 1862

Dear Sir

It is always very gratifying to me to hear from you, but
you may imagine how much pleasure your last letter has given me when
I tell you that for the last ten years I have been vigorously contending that to
make good observatory instruments they should be treated as Engineers
work, & made in Manchester i.e. with such implements as are used in
machine shops, instead of the rickety miniature tackle employed by
the London Opticians - to have the corroboration of your spontane-
ously given opinion is very satisfactory to me, as I have been urging
the matter strongly on my friend Prof Forbes who has been communica-
ting with the Astronomer Royal on the subject, and who a few days ago
showed me a Notice by Mr Airy in which he fully adopts the same
views - I have no doubt therefore that if you should have an op-
portunity of conferring with him, that between you something may
be achieved on better principles of construction than has yet been
forthcoming.

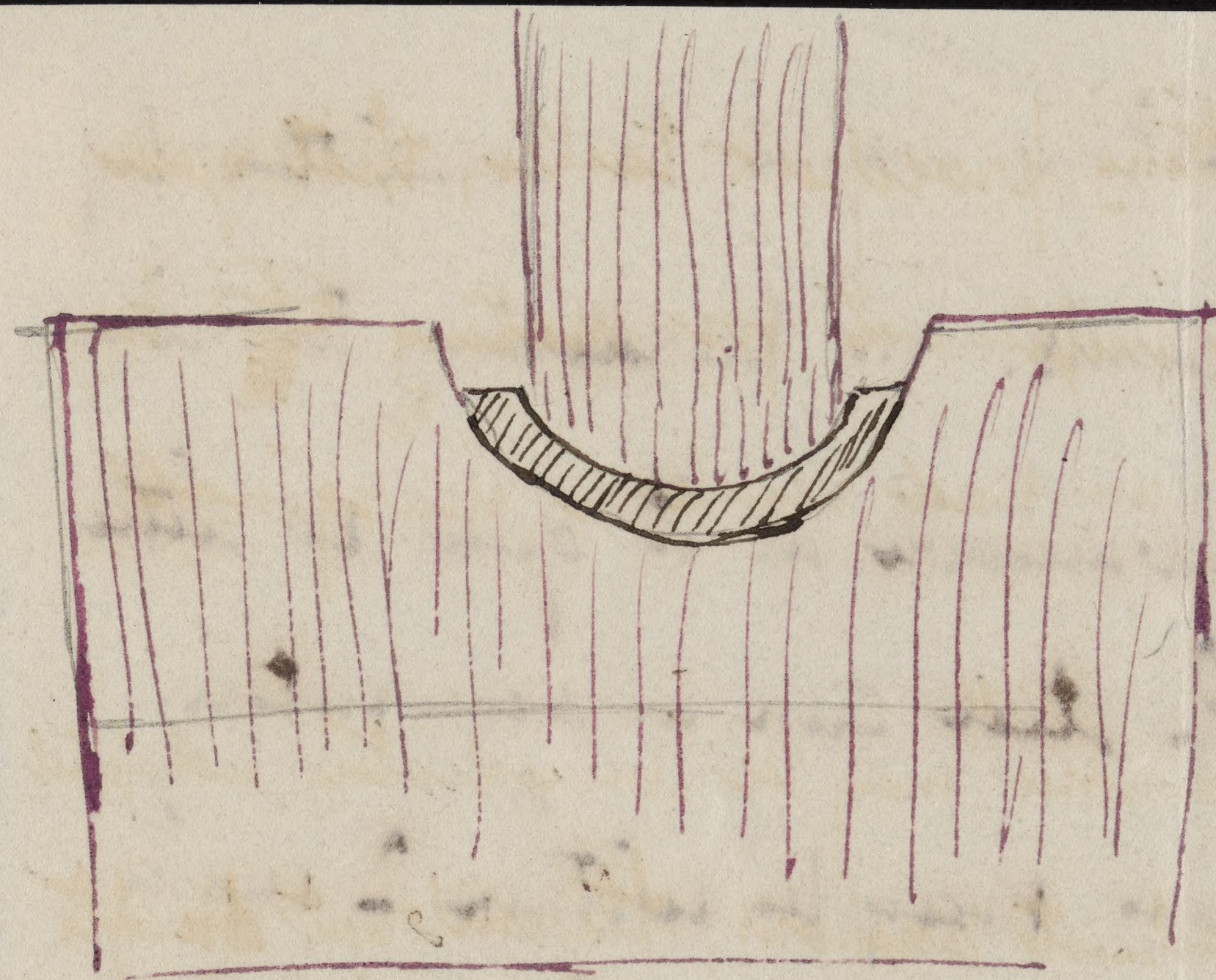
I am glad you have seen Mr Gambey's automatic dividing
apparatus - it is curious to think that a tipsy cabman sitting in
a lobby, may by his awkward muscular exertions be effecting
the nicest divisions on an instrument locked up in a room
to which he has no access.

I have been so much engaged ever since I saw you

in trials to improve screw cutting processes & tackle, that your notice of M. G. having a good implement for making  has much interest for me - I wish you had made a marginal sketch of it.

I hope your "thunderbolt hammer" may be immediately adopted at Woolwich &c - what fine compact anchors, Steamboat Drafts &c it must make - while it takes the heavy end of the scale, the Bolton forging machine will be nearly as useful in the smaller class of articles, & between them, an important advantage must be gained in a wide field of operations. It is remarkable that 3 such machines as the American shingling apparatus, your thunderbolt & Rydler's forging machine should have appeared so nearly at the same epoch.

A little device has recently occurred to me which I should like to learn your opinion of. I was trying to get a really smooth half round file, but could not find anything approaching to it, or that could be used without making streaks on the work. I then asked myself if a smooth half round might not be made out of a smooth equalizing file, by taking it before being hardened, & pressing it in a copper swage until it became convex on one side & concave on the other; &



whether cylindrical tubular files might not be made by cutting thin blanks on one side & bending round mandrels.

On proposing this plan to Mr. Stubbins he told me that a partial attempt at the half round had been made many years ago & given up from the difficulty of giving a good shape. He sent me a specimen which explained the cause of the difficulty, as he had forged the blank before & of unequal thickness, whereas by making them like equalizing files, the swage & press, or ridge & furrow rolls would insure accurate shape - hollow half rounds might be made in this way, while in any other way it would be nearly impossible - I have asked Johnson & Cammel & Co. of Sheffield to make me a few, and if you get files from them, I should like that you would get a few of this plan & give them a trial.

I forget whether I mentioned my gas blowpipe which acts under a pressure of 30 inches of water (on the air) I find it so convenient in little forgings, soldering, hardening &c that I

ROBISON, SIR JOHN (1778-1843) Inventor.

A.L.S. to James Nasmyth (1808-1890) Engineer.

FLETCHER-57

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A most interesting letter packed with information about his own inventions and those of Nasmyth. He expresses the opinion that good observatory instruments should be treated as engineer's work "instead of the rickety miniature tackle employed by the London opticians". He discusses Mr. Gambey's automatic dividing apparatus, his own efforts "to improve screw cutting processes", and Nasmyth's "thunderbolt hammer".

Yours faithfully,

72-7-21-217
C.A. Kyrle Fletcher (Mrs.)

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